

*Long-Life
Nickel-Cadmium Cells
For Portable Convenience*





As electronics technology becomes more and more advanced, your markets demand a higher level of sophistication in convenient, portable products. These increasing demands are placing more stringent requirements on rechargeable batteries.

Gates Energy Products nickel-cadmium cells offer unsurpassed total power delivery in a multitude of cell sizes for outstanding product design flexibility. Because Gates nickel-cadmium cells are offered in sizes from 0.065 to 6.7 amp-hours, you get a high degree of flexibility to meet even your most unique requirements, affording you complete design freedom.

Available in a wide range of standard configurations -- including C_s, 1/3AA, 1/2AA, AA, 4/5C_s, 2/3A_f, A_f, C, 1/2D, D, F and MP 80 -- Gates nickel-cadmium batteries can also be custom assembled in a wide variety of configurations. If you have a special challenge, our full lines of premium GEMAXTM batteries, high-temperature Gold Top[®] batteries, fast-charge XP60[®] batteries, memory-preservation MP² batteries and high-capacity LRT batteries provide the performance you need.

At Gates Energy Products, we design our nickel-cadmium cells with your needs in mind. You get maintenance-free operation and a long cycle life, with the option to mount batteries in any position, making our batteries ideal for a wide range of cordless applications. And we continue to seek ways to enhance the delivered discharge voltage, capacity and cycle life of our nickel-cadmium cells, to give you even greater design freedom.

CANTEC REPRESENTATIVE INC.
8 Strathearn Ave., Unit 18
BRAMPTON, ONT. L6T 4L9
TEL: (416) 791-5922

Long-Lasting Power For Portable Products

Gates Energy Products sealed, rechargeable nickel-cadmium batteries are excellent power sources for a wide variety of applications. They offer high capacity and low internal resistance for longer run times and maximum power delivery.

The construction of Gates cells provides other performance advantages:

- **Long life**

Batteries have a long life while on standby charge. Since nickel-cadmium batteries neither consume nor lose active material during charging, they may be continuously overcharged at the specified rates with negligible effect on performance or life.

- **No maintenance and easy storage**

Nickel-cadmium batteries may be placed in open circuit storage in any state of charge for extended periods of time, without damage or loss of rechargeability. Because of their sealed configuration, there's no need to replenish electrolyte.

- **Excellent discharge capacity**

Due to their low internal resistance, batteries can be discharged at rates up to 20 times their 1-hour discharge rate without impacting service life.

- **Resealable safety vent**

If needed, Gates safety vent opens to relieve excessive pressure, then reseals automatically to prevent the cell from drying out.

- **Mount in any position**

Small, lightweight cells will operate in any position. Maintenance-free, long-life performance makes them ideal for numerous cordless applications.

- **Overcharge capability**

Gates cells can be held on constant current overcharge for years, then provide instant power necessary for the load.

- **Flat discharge voltage profile**

A flat voltage discharge curve means voltage will vary as little as 100 millivolts per cell until they near the end of discharge. Power delivery remains relatively constant during 80 to 90% of discharge.

- **Fast charging**

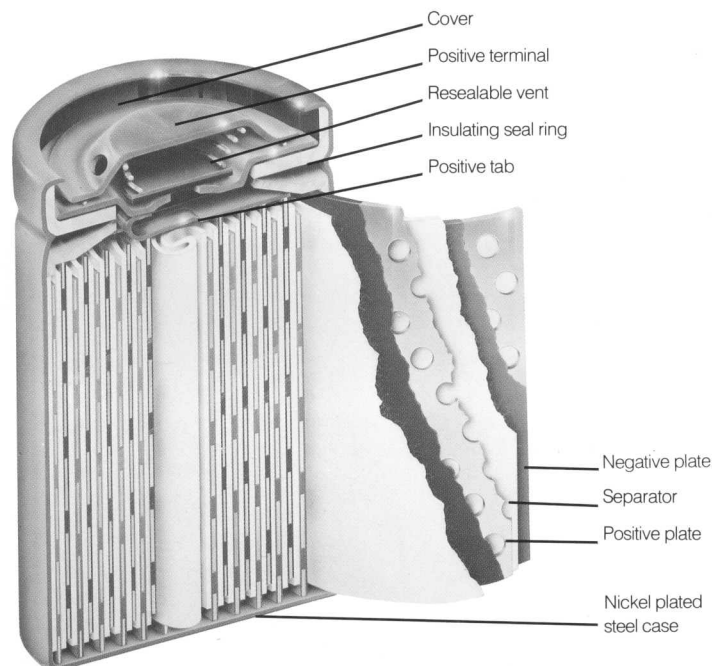
Standard and special cell designs offer economical solutions for fast charge applications.

- **Operational over wide temperature range**

Gates Energy Products nickel-cadmium batteries are available in operational ranges from -20°C to $+50^{\circ}\text{C}$. High-temperature cells range up to $+70^{\circ}$ (cell temperature). Cells have long life even at elevated temperatures.

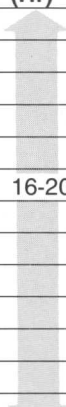
- **No shipping restrictions**

Cells are classified as "dry" by the U.S. Department of Transportation and the International Air Transport Association and are not subject to Restricted Articles Regulations covering air shipment.



Cell Description

Standard Cells (G-Series) Standard construction nickel cadmium cells

Model Number	Cell Type	Capacity (mAh)		Typical Re (mΩ)	Dimensions		Typical Wt (gr(oz))	Maximum Charging Current			
		0.2C min	1.0C min		Max Ht mm(in)	Max Dia mm(in)		Std (mA)	Time (Hr)	Quick (mA)	Time (Hr)
G-180AAA	AAA	180	160	65	44.2(1.74)	10.3(0.40)	10.5(0.37)	16		55	4-5
G-270AA	1/2AA	270	250	49	32.0(1.26)	14.2(0.56)	13.0(0.46)	25		85	4-5
G-525A	2/3Af	525	475	35	27.7(1.09)	16.8(0.66)	17.0(0.60)	48		160	4-5
G-650AA	AA	650	600	35	49.0(1.93)	14.2(0.56)	24.0(0.85)	60		150	5-6
G-650CS	1/2Cs	650	600	29	25.9(1.02)	22.2(0.87)	26.4(0.93)	60		200	4-5
G-825A	Af	825	750	29	49.3(1.94)	16.5(0.65)	28.4(1.00)	75		250	4-5
G-1200CS	4/5Cs	1200	1100	21	33.3(1.31)	22.2(0.87)	34.6(1.22)	105		330	4-5
G-1600CS	Cs	1600	1500	22	42.2(1.66)	22.2(0.87)	48.2(1.70)	150		400	5-6
G-2000C	C	2000	1800	19	46.2(1.82)	25.5(1.01)	64.4(2.27)	180		600	*4-5
G-2500C	C	2500	2300	19	49.0(1.93)	25.7(1.01)	69.3(2.45)	230		780	*4-5
G-2300D	1/2D	2300	2200	18	35.8(1.41)	32.3(1.27)	76.3(2.69)	220		900	*4-5
G-4300D	D	4300	4000	11	58.4(2.30)	32.3(1.27)	130.0(4.59)	400		1600	*4-5
G-6700F	F	6700	6200	6	87.4(3.44)	32.3(1.27)	193.1(6.81)	620		N/A	N/A

*G-2000C, G-2500C, G-2300D and G-4300D: Charge termination or reduction from quick charge rate is required.

Fast Charge Cells (GF-Series) Standard cells with fast charge capability

Model Number	Cell Type	Capacity (mAh)		Typical Re (mΩ)	Dimensions		Typical Wt (gr(oz))	Fast Charge (1-Hour Charge) (mA)
		0.2C min	1.0C min		Max Ht mm(in)	Max Dia mm(in)		
GF-270AA	1/2AA	270	250	49	32.0(1.26)	14.2(0.56)	13.0(0.46)	300
GF-525A	2/3Af	525	475	35	27.7(1.09)	16.8(0.66)	17.0(0.60)	570
GF-650AA	AA	650	600	35	49.0(1.93)	14.2(0.56)	24.0(0.85)	700
GF-650CS	1/2Cs	650	600	29	25.9(1.02)	22.2(0.87)	26.1(0.92)	720
GF-825A	Af	825	750	29	49.3(1.94)	16.5(0.65)	28.4(1.00)	900
GF-1200CS	4/5Cs	1200	1100	21	33.3(1.31)	22.2(0.87)	34.6(1.22)	1260
GF-1600CS	Cs	1600	1500	22	42.2(1.66)	22.2(0.87)	48.2(1.70)	1650
GF-2000C	C	2000	1800	19	46.2(1.82)	25.7(1.01)	64.4(2.27)	2160
GF-2500C	C	2500	2300	19	49.0(1.93)	25.7(1.01)	69.3(2.45)	2760

Note: Fast charge (1-hour) requires charge termination control.

GEMAX™ Cells (GX-Series) Longer run times and higher power delivery

Model Number	Cell Type	Capacity (mAh)		Typical Re (mΩ)	Dimensions		Typical Wt (gr(oz))	Maximum Charging Current			
		0.2C min	1.0C min		Max Ht mm(in)	Max Dia mm(in)		Std (mA)	Time (Hr)	Quick (mA)	Time (Hr)
GX-1100CS	4/5Cs	1100	1050	15	33.3(1.31)	22.2(0.87)	34.6(1.22)	105	16-20	330	4-5
GX-1500CS	Cs	1500	1400	10	42.2(1.66)	22.2(0.87)	46.2(1.63)	140	16-20	475	4-5

GEMAX™ Fast Charge Cells (GXF-Series) GEMAX benefits with one hour charge capability

Model Number	Cell Type	Capacity (mAh)		Typical Re (mΩ)	Dimensions		Typical Wt (gr(oz))	Fast Charge (1-Hour Charge) (mA)
		0.2C min	1.0C min		Max Ht mm(in)	Max Dia mm(in)		
GXF-1100CS	4/5Cs	1100	1050	15	33.3(1.31)	22.2(0.87)	34.6(1.22)	1260
GXF-1500CS	Cs	1500	1400	10	42.2(1.66)	22.2(0.87)	46.2(1.63)	1680

Note: Fast charge (1-hour) requires charge termination control

Goldtop® Cells (GH-Series) Excellent life at elevated temperatures

Model Number	Cell Type	Capacity (mAh)		Typical Re (mΩ)	Dimensions		Typical Wt (gr(oz))	Maximum Charging Current			
		0.2C min	1.0C min		Max Ht mm(in)	Max Dia mm(in)		Std (mA)	Time (Hr)	Quick (mA)	Time (Hr)
GH-110AA	1/3AA	110	100	102	17.0(0.67)	14.2(0.56)	7.4(0.26)	10	↑	33	4-5
GH-550AA	AA	550	500	40	49.0(1.93)	14.2(0.56)	20.4(0.72)	50	↑	170	4-5
GH-2300D	1/2D	2300	2200	18	35.8(1.41)	32.3(1.27)	76.3(2.69)	220	16-20	N/A	N/A
GH-4300D	D	4300	4000	12	58.4(2.30)	32.3(1.27)	130.1(4.59)	400	↓	N/A	N/A
GH-6000F	F	6000	5600	5	87.4(3.44)	32.3(1.27)	218.0(7.69)	560	↓	N/A	N/A

GEMAX™ Goldtop® Cells (GXH Series) Longer run times and excellent power delivery, with excellent high temperature life

Model Number	Cell Type	Capacity (mAh)		Typical Re (mΩ)	Dimensions		Typical Wt (gr(oz))	Maximum Charging Current			
		0.2C min	1.0C min		Max Ht mm(in)	Max Dia mm(in)		Std (mA)	Time (Hr)	Quick (mA)	Time (Hr)
GHX-1400CS	Cs	1400	1300	15	42.2(1.66)	22.2(0.87)	43.7(1.54)	130	16-20	435	4-5

Goldtop® Plus Cells (GHC Series) Excellent high temperature life, *Plus* improved high temperature charge acceptance and capacity

Model Number	Cell Type	Capacity (mAh)		Typical Re (mΩ)	Dimensions		Typical Wt (gr(oz))	Maximum Charging Current			
		0.2C min	1.0C min		Max Ht mm(in)	Max Dia mm(in)		Std (mA)	Time (Hr)	Quick (mA)	Time (Hr)
GHC-1200CS	Cs	1200		20	42.2(1.66)	22.2(0.87)	46.1(1.63)	130	16-20		
GHC-4000D	D	4000		14	58.4(2.30)	32.3(1.27)	130.0(4.59)	400	16-20		

MP2™ Cells (GM-Series) Memory Preservation Product. Excellent life and leakage protection at elevated temperatures

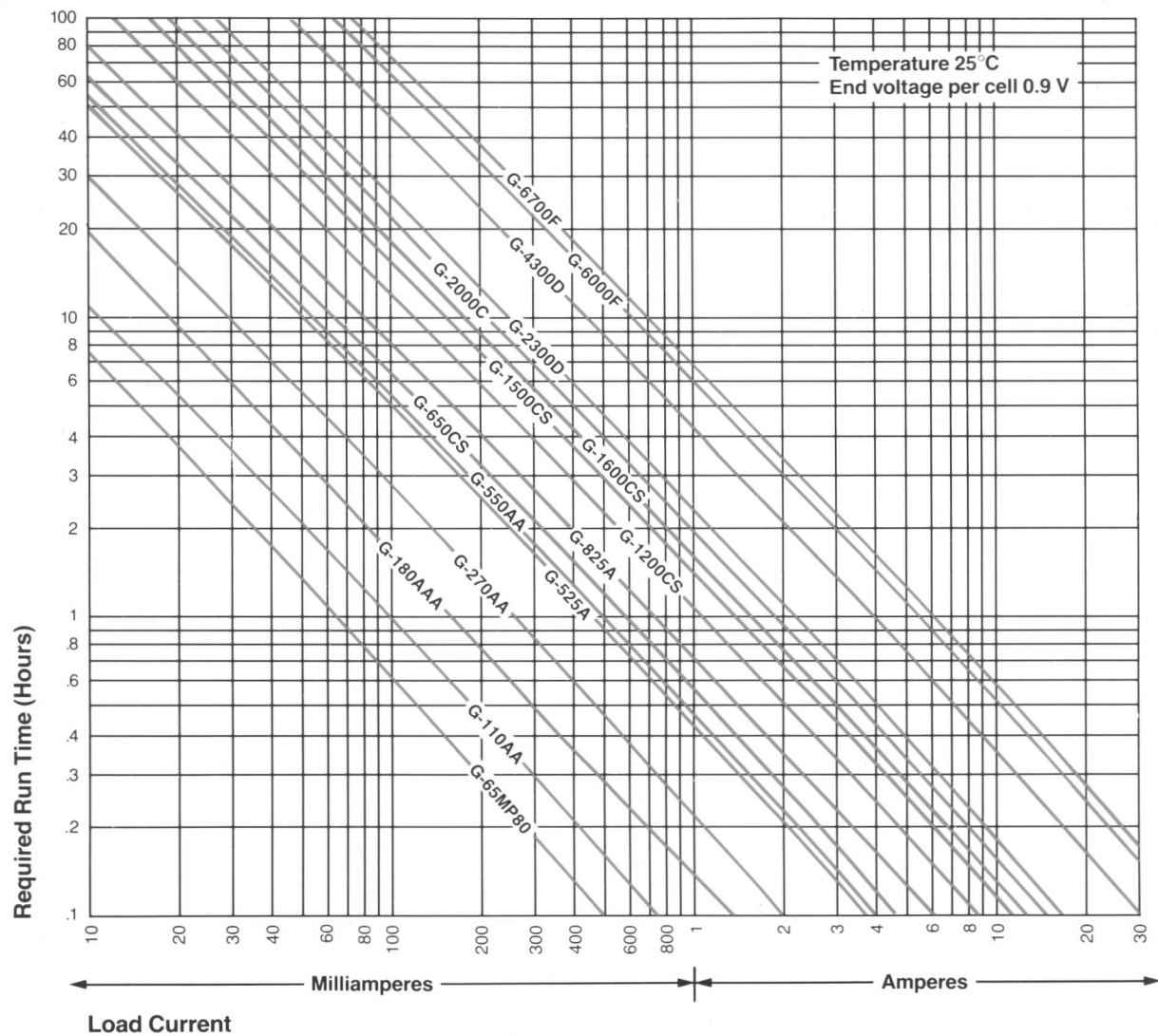
Model Number	Cell Type	Capacity (mAh)		Typical Re (mΩ)	Dimensions		Typical Wt (gr(oz))	Maximum Charging Current			
		0.2C min	1.0C min		Max Ht mm(in)	Max Dia mm(in)		Std (mA)	Time (Hr)	Quick (mA)	Time (Hr)
GM-65MP80	MP80	65		183	15.0(0.59)	12.7(0.50)	5.1(0.18)	7	↑	22	↑
GM-100AA	1/3AA	100		118	17.0(0.67)	14.2(0.56)	7.4(0.26)	10	16-20	33	4-5
GM-250AA	1/2AA	250		61	32.0(1.26)	14.2(0.56)	12.9(0.46)	25	↑	85	↑
GM-450AA	AA	450		37	49.0(1.93)	14.2(0.56)	23.5(0.83)	45	↓	150	↓

LRT™ Cells (GL Series) Long RunTime product provides the highest available capacity

Model Number	Cell Type	Capacity (mAh)		Typical Re (mΩ)	Dimensions		Typical Wt (gr(oz))	Maximum Charging Current			
		0.2C min	1.0C min		Max Ht mm(in)	Max Dia mm(in)		Std (mA)	Time (Hr)	Quick (mA)	Time (Hr)
GL-800AA	AA	800	700	35	49.0(1.93)	14.2(0.56)	24.1(0.85)	70	16-20	150	7-9
GL-1100A	4/5Af	1100	1000	30	42.4(1.67)	16.8(0.66)	22.7(0.80)	100	16-20	200	7-9
GL-1700CS	Cs	1700	1500	24	42.2(1.66)	22.2(0.87)	46.2(1.63)	150	16-20	300	7-9

- Nominal cell voltage 1.2V.
- Standard range for use up to +50°C (cell temperature).
- Goldtop High temperature cells range up to +70° (cell temperature).
- Contact your Gates regional sales office for applications in ambient temperatures below +0°C and above +70°C.
- Brief excursions to temperatures higher than specified may be tolerated. Cell life is decreased by heat from overcharging or ambient sources.
- The sizes shown are maximum overall bare cell dimensions.
- Fast charge systems will require charge control for high rate termination.
- For additional information consult Gates Energy Products Battery Application Manual.
- Our design and application engineering services are available for custom designed batteries.

Performance Characteristics



Enhanced Performance Cells For Demanding Applications

At Gates Energy Products we've even further enhanced our nickel-cadmium performance with our GEMAX, Gold Top, XP60, MP² and LRT batteries. We have pioneered major technological advances in cell and electrode design to bring you our GEMAX series with greater ampere-hour capacity and high-rate discharge capability in the same volume. With GEMAX, you can produce lighter, more compact battery-powered products.

Our high-temperature Gold Top batteries have continuous operating temperature capability up to 70°C and provide long life even at elevated temperatures. For fast-charge applications, we offer standard and special XP60 cell designs for 1-hour charging in chargers with overcharge control. And MP² memory preservation cells provide integrated circuit applications with reliable memory hold-up, while offering protection from loaded storage leakage.

Gates Energy Products nickel-cadmium cells and batteries are excellent for use in consumer products, such as household products, power tools, personal care products, audio-visual products and toys; telecommunications equipment; memory back-up applications; medical equipment and instruments; industrial instruments; aerospace and more.

We Make More Than Batteries

When you choose Gates Energy Products nickel-cadmium cells and batteries you get more than a product. Our customer support helps you choose the battery that's right for your application and ensures that your product design achieves maximum performance.

- **Technical Support**

Because we know that even the best battery performs better when your product design is matched to the battery's characteristics, our technical support staff works with you from the beginning in the design and development of your rechargeable, battery-powered products.

- **Applications Engineering**

Our applications laboratory and engineers tackle your more complicated design questions, testing your product designs with Gates batteries to ensure compatibility **before** you make major manufacturing decisions.

- **Value-Added Services**

One source can supply you with Gates nickel-cadmium batteries built to your exact specifications. Whatever the configuration, we can provide the custom-built battery you need, including multi-cell shrink sleeve and plastic case assemblies and product packaging.

- **Sales Engineering**

When you choose Gates batteries, you'll develop a working relationship with your own personal sales engineer who knows your company and your products.

The Power of Great Ideas

At Gates Energy Products, we make more than batteries. We give you the power to bring ideas to life. With our extensive line of maintenance-free rechargeable batteries to power products for virtually any application, from cordless shavers to satellites. Backed by comprehensive customer support to ensure you get the right battery and the right design. To put the power of great ideas to work for you, just call your Gates regional sales office.

Sealed-Lead

- Cyclon Single Cell and Monobloc Batteries

Nickel-Cadmium

- GEMAX™, Goldtop® and XP60™ Cells
- PowerStick® Batteries
- Aerospace/Satellite Cells

Nickel-Hydrogen

- Aerospace/Satellite Cells

Sales Offices

North America

Eastern Region

1 Prestige Drive
Meriden, Connecticut 06450

Tel. 203 238-6812
Fax 203-238-6887

Southern Region

5555 Triangle Parkway
Waterford Center, Suite 330
Norcross, Georgia 30092

Tel. 404 446-8090
800 554-6795
Fax 404-441-1284

Central Region

300 Park Boulevard
Itasca, Illinois 60143-2681

Tel. 312 250-0015
Fax 312-250-0210

Western Region

555 Pointe Drive
Building Three, Suite 307
Brea, California 92621

Tel. 714 529-2117
Fax 714-529-2399

Pacific and Asia

Hong Kong

Gates Energy Products (Asia) Ltd.
3706A Shun Tak Centre
200 Connaught Road, Central
Hong Kong

Tel. 852-5-400600
Telex 780-61632
Fax 852-5-488942

Europe

United Kingdom

Gates Energy Products Ltd.
Dukes Court
Duke Street
Woking
Surrey GU21 5BH
United Kingdom

Tel. 44-483-757505
Telex 859789
Fax 44-483-740208

France

Gates Energy Products France
Building Apollo
48 Cours Blaise Pascal
B.P. 124
91004 Evry Cedex
France

Tel. 33-1-60782463
Telex 602365F
Fax 33-1-60781845

Sweden

Gates Nordic AB
Box 1292
Torshamnsgatan 39
S-164 28 Kista
Sweden

Tel. 46-8-750-3110
Telex 19678 Gates S
Fax 46-8-750-9939

West Germany

Gates GmbH
Industriestrasse 27-29A
D-6082 Moerfelden-Walldorf
West Germany

Tel. 49-6105-24061
Telex 416065 Gates D
Fax 49-6105-24449



Gates Energy Products, Inc.
Gainesville, Florida 32602